



Pervious Pavement Roadways: Survey of Experiences

Prepared for
**Division of Transportation System Development
Bureau of Technical Services**

Prepared by
**CTC & Associates LLC
WisDOT Research & Library Unit
May 24, 2007**

Transportation Synthesis Reports are brief summaries of currently available information on topics of interest to WisDOT staff throughout the department. Online and print sources for TSRs include NCHRP and other TRB programs, AASHTO, the research and practices of other transportation agencies, and related academic and industry research. Internet hyperlinks in TSRs are active at the time of publication, but changes on the host server can make them obsolete. To request a TSR, e-mail research@dot.state.wi.us or call (608) 261-8198.

Request for Report

WisDOT's Division of Transportation System Development wanted to learn about experiences that other DOTs have had in building roadways using pervious pavement. Pervious pavement is designed to allow water to flow completely through it, from its surface down to the soil under its base. Pervious pavement can be constructed of either concrete or asphalt. This report summarizes the responses we received from FHWA, 16 states and a Canadian province to a survey on this topic.

Summary

We sent an e-mail survey to all state DOTs, Canadian provincial transportation agencies and FHWA, asking the following key questions about pervious pavements:

1. *Has your agency built or considered building permeable pavements, in the form of porous asphalt, pervious concrete, or concrete paving blocks? If so, was it for a traffic or parking application?*
2. *If you have used permeable pavement in either a traffic or parking application, do you have performance data? If so, can you provide a copy of the data or online link?*
3. *Has your agency studied the cost-effectiveness of permeable pavement, in terms of service life and maintenance, or its environmental advantages? If so, can you provide a copy of the report or online link?*

We received responses from FHWA, Arizona, Arkansas, Florida, Idaho, Illinois, Indiana, Iowa, Maryland, Mississippi, Montana, New Hampshire, New York, Oregon, Texas, Virginia, Washington, and Ontario, Canada.

FHWA commented on recent testimony to Congress related to this technology. In **Washington, Arizona** and **Oregon**, pervious pavement roads have been put in place in limited capacities. Some respondents also provided additional feedback on **concerns** related to pervious pavement.

Responses

A summary of the survey responses follows, including contact information for agencies that reported some activity or interest in pervious pavement for road applications.

Federal Response

Marci Kenney of FHWA reported that on May 10, 2007, Gloria Shepherd, FHWA Associate Administrator for Planning, Environment and Realty, testified to the House of Representatives Committee on Science and Technology about green infrastructure. The same committee heard a statement focused on pervious pavement and its contribution to environmental protection given by Daniel Huffman, Managing Director of National Resources for the National Ready Mixed Concrete Association. The text of his testimony is available at http://democrats.science.house.gov/Media/File/Commdocs/hearings/2007/tech/10may/huffman_testimony.pdf. Huffman detailed a pervious pavement project in Washington state, described below.

Contact: Marci Kenney, FHWA, (202) 493-3117 or marci.kenney@fhwa.dot.gov.

Road Projects

Bellevue, Wash. According to Huffman's testimony to Congress, "In 2006, owner/developer Craig Morrison of CMI Homes in Bellevue, Wash., completed the construction of a 20-home residential subdivision in Sultan, Wash., called Stratford Place. 100% of the subdivision's original general hardscape was built with pervious concrete—roadway, driveways and sidewalks."

Contact: Daniel Huffman, National Ready Mixed Concrete Association, (503) 292-7729 or dhuffman@nrmca.org.

City of Portland, Ore. "In 2004, Environmental Services paved three blocks of streets in the Westmoreland neighborhood with permeable pavement that allows water to go through the street surface and into the ground. It is the first use of this type of permeable paving material on a public street in Portland, although similar materials are used locally in parking lots and private driveways." A summary of this project is available at <http://www.portlandonline.com/bes/index.cfm?c=eeegd&a=hhahe>.

Contact: Brett Kesterson, Portland Department of Transportation, (503) 823-7163 or brett.kesterson@pdxtrans.org.

Arizona. "The state built one pervious pavement road project in 1985 as an experiment on an urban state highway section." Reports are available at http://www.azdot.gov/TPD/ATRC/publications/project_reports/PDF/AZ227-first.pdf and http://www.azdot.gov/TPD/ATRC/publications/project_reports/PDF/AZ227-int-8901.pdf.

Contact: See the Arizona Transportation Research Center staff list at <http://www.azdot.gov/TPD/ATRC/staff/index.asp>.

Interest in Road Applications

Washington. "Washington has used pervious pavement for very low use applications such as parking areas, paths and one short access road. WSDOT has used pervious pavement a handful of times; however, there is interest within the agency to use more pervious pavement."

Contact: Jeff Uhlmeier, Washington State DOT, (360) 709-5485 or uhlmeij@wsdot.wa.gov.

Parking Lots Only

Iowa. "Iowa has a new parking lot at a new building (Motor Vehicle Division) that has permeable concrete. We are not considering building other permeable pavements."

Indiana. "Some parking lots in Indianapolis are constructed with pervious pavement, but not under state jurisdiction."

Open Graded Layers

Florida. “As with many other states, Florida does use permeable asphalt in the following applications:

1. Open graded friction course (surface mix for high speed roadways)
 2. Asphalt permeable base (open graded mix placed under selected portland cement concrete pavements)
- Florida has used a permeable concrete mix (89 stone and cement) as a substitute for edge drains for concrete pavements in some instances.”

Oregon. “ODOT uses an open graded mix for a wearing course mostly on its higher volume highways.”

Virginia. More information about permeable wearing courses in Virginia is available at <http://vtrc.virginiadot.org/PubDetails.aspx?PubNo=05-R11>.

Mississippi. “Mississippi is constructing an open graded friction course (about 15% voids) for the first time later this month. It also utilizes an asphalt treated drainable base (about 30% voids) under many of its new pavements.”

No Work on This Topic

- Arkansas
- Illinois
- Maryland
- Montana
- Texas
- Ontario, Canada

Expressed Concerns

New York. “There is a higher potential for failure under ‘high speed’ traffic. There also seems to be differing opinions regarding required activities (and frequency) to maintain porosity.”

Idaho. “It has been suggested on a project-specific basis. However, no districts have tried it. It is probably reasonable to say there is virtually no interest in permeable pavement in Idaho. Concerns have been raised that the risk of failure is high for most any application due to the cold weather climate in this state. The HMA material is basically the same thing as Asphalt Treated Permeable Base that is used on occasion by ITD. However, ATPB is a base layer and not a surfacing layer, hence the material is confined and graded for drainage.”

Florida. “Florida’s Department of Environmental Protection indicated that there was too high a potential for petroleum based products being transported in the runoff so the state has not pursued this activity. However, recently the DEP has changed its mind on this ruling because several pervious parking lots have been constructed by independent commercial contractors. The effort was spearheaded by the state’s local concrete industry association, Florida Concrete and Products Association.”

New Hampshire. “New Hampshire has rejected the use of permeable pavements for traffic applications. Introducing additional water to the select materials and subgrade is not a good idea in a freeze/thaw environment, and premature aging of the binder as a result of increased oxygen supply is a concern. Porous pavements could lead to increased salt usage and create problems with ice pack in the pavement. There is some support for using porous pavements in parking applications to mitigate runoff. There were plans to try this in a park-and-ride lot being built as part of an upcoming Interstate expansion project, but the site did not lend itself to that treatment.”